Springer

1st edition

1st ed. 2019, XII, 390 p. 126 illus., 109 illus. in color.

Printed book
Hardcover

Printed book
Hardcover
ISBN 978-3-030-05830-2
£ 129,99 | CHF 177,00 | 149,99 € | 164,99 € (A) | 160,49 € (D)

Available

Discount group
Science (SC)

Product category
Proceedings

Series
Mathematics and Visualization

Mathematics : Mathematical and Computational Biology

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Computational Diffusion MRI

International MICCAI Workshop, Granada, Spain, September 2018

- Contributions on new important topics that are gaining momentum within the diffusion MRI community
- Details new computational methods and estimation techniques for microstructure imaging and brain connectivity mapping
- Features papers presented at the 2018 MICCAI Workshop on Computational Diffusion MRI (CDMRI'18)

This volume gathers papers presented at the Workshop on Computational Diffusion MRI (CDMRI'18), which was held under the auspices of the International Conference on Medical Image Computing and Computer Assisted Intervention in Granada, Spain on September 20, 2018. It presents the latest developments in the highly active and rapidly growing field of diffusion MRI. The reader will find papers on a broad range of topics, from the mathematical foundations of the diffusion process and signal generation, to new computational methods and estimation techniques for the in-vivo recovery of microstructural and connectivity features, as well as harmonisation and frontline applications in research and clinical practice. The respective papers constitute invited works from high-profile researchers with a specific focus on three topics that are now gaining momentum within the diffusion MRI community: i) machine learning for diffusion MRI; ii) diffusion MRI outside the brain (e.g. in the placenta); and iii) diffusion MRI for multimodal imaging. The book shares new perspectives on the latest research challenges for those currently working in the field, but also offers a valuable starting point for anyone interested in learning computational techniques in diffusion MRI. It includes rigorous mathematical derivations, a wealth of full-colour visualisations, and clinically relevant results. As such, it will be of interest to researchers and practitioners in the fields of computer science, MRI physics and applied mathematics alike.

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ISBN 978-3-030-05830-2 / BIC: PDE / SPRINGER NATURE: SCM31000